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[PGD 32: Cutting tools]

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पेंच वाली चूड़ियाँ काटने के औजार — तकनीकी पूर्ति शर्तें

(दूसरा पुनरीक्षण)

Indian Standard

SCREWING TAPS — TECHNICAL SUPPLY CONDITIONS

(*Second Revision*)

UDC 621·993 : 006·87

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

July 1992

Price Group 4

AMENDMENT NO. 1 JANUARY 1996
TO
IS 6171 : 1992 SCREWING TAPS — TECHNICAL SUPPLY CONDITIONS

(Second Revision)

Typographical errors have crept in the text of this standard as far as 'year of printing' is concerned. Year of printing shall be read as '1992' in place of '1991' in the text of the following Indian Standards wherever it appears:

IS 6173 (Parts 1 and 2), IS 6175 (Parts 1 to 3 and Parts 6 to 8).

(*Page* 5, *clause* 3.5.6, *line* 2) — Substitute 'or' *for* 'of'.

(*Page* 6, *clause* 4, *line* 5) — Substitute 'High speed steel' *for* 'High speel steel'.

(*Page* 6, *clause* 6.9, *line* 2) — Substitute '1 : 100 0' *for* '1.100 0'.

(*Page* 8, *clause* 6.18, *lines* 8 *and* 9) — Substitute 'IS 4218 (Parts 1 to 6)' *for* 'IS 4218 : 1976 (Parts 1 to 6)'.

Thread Cutting Taps and Dies Sectional Committee, PE 13

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Thread Cutting Taps and Dies Sectional Committee had been approved by the Production Engineering Division Council.

This standard was earlier published in 1971 and revised in 1979. In the present revision the following changes have been made:

a) A thorough review of all the contents have been made and suitable technical changes have been made.

b) New figures have been added to illustrate different types of screwing taps and the existing figures have been corrected.

c) The formulae for calculating thread profile dimensions and Annex A in the earlier edition has been deleted and now covered in IS 6173 (Part 1) : 1991.

d) In the table given for radial runout, the corresponding IT values have been deleted. In its place the actual values have been added keeping in view of the prevailing manufacturing conditions in India.

e) The sequences of the clauses have been changed in order to bring continuity in the subject.

f) The helical flute angles recommendation has been added.

g) Tolerances for overall length and threaded length has been added.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

AMENDMENT NO. 2 MARCH 2001
TO
IS 6171 : 1992 SCREWING TAPS — TECHNICAL SUPPLY CONDITIONS

(Second Revision)

(*Page* 6, *clause* 5) — Substitute 'Driving square and holding length of the shank' *for* 'Driving square'.

(BP 10)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SCREWING TAPS — TECHNICAL SUPPLY CONDITIONS

(Second Revision)

1 SCOPE

This standard covers the technical supply conditions of screwing taps for general engineering purposes.

2 REFERENCES

The Indian Standards listed in Annex A are necessary adjusts to this standard.

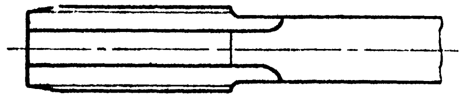
3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

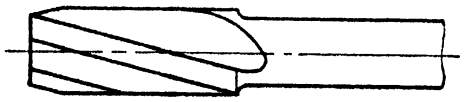
3.1 Screwing Tap — A rotating tool to form screw thread in holes, consisting essentially of a threaded body having two or more straight or helical flutes, or without the flutes having lobes, intersecting lines with the threaded body of which form the cutting profile of the tool. It is provided with a shank and a driving square for holding and driving.

3.2 Classification of Screwing Taps — Shall be as given in Fig. 1.

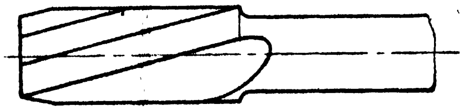
Screwing taps are classified based on thread, flutes and shank configuration.



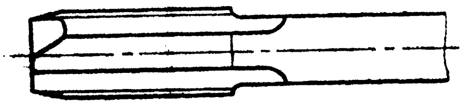
Straight flute screwing tap



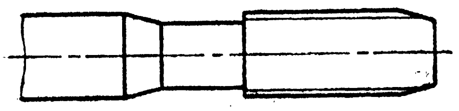
R. H. helical flute screwing tap



L. H. helical flute screwing tap

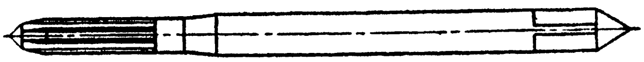


Screwing tap with spiral point

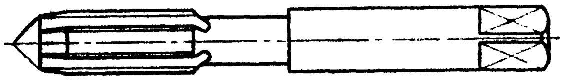


Fluteless screwing tap

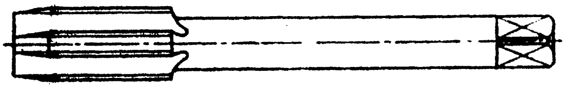
1A FLUTE CONFIGURATION



Full diameter shank screwing tap with taper connecting portion between shank and thread



Full diameter shank screwing tap with recess



Relieved shank screwing tap

1B SHANK CONFIGURATION

FIG. 1 CLASSIFICATION OF SCREWING TAPS

3.2.1 *Finish of Screwing Taps*

3.2.1.1 *Cut thread screwing tap* — A screwing tap in which the threads on the body are formed by cutting or rolling, while the screwing tap blank is still in unhardened condition.

3.2.1.2 *Ground thread screwing tap* — A screwing tap in which thread on the body are finished by grinding, when the screwing tap blank is in hardened and tempered condition.

3.2.2 *Types of Threaded Portion of Screwing Taps*

3.2.2.1 *Serial screwing tap* — A set of two or three screwing taps with identical general dimensions but progressively increasing major diameter and pitch diameter and varying chamfer lengths. They are designated as Rougher, Intermediate and Finisher screwing taps.

3.2.2.2 *Non-serial screwing tap* — A set of two or three screwing taps with identical general dimensions including thread dimensions and varying chamfer lengths. They are designated as Taper, Second and Bottoming screwing taps.

3.2.2.3 *Hand screwing tap and short machine screwing tap* — A screwing tap with shorter shank length for general purposes. These screwing taps can be used for manual tapping as well as for machine tapping.

3.2.2.4 *Long shank machine screwing tap* — A screwing tap with longer shank length for longer reach, to be used for machine tapping.

3.2.3 *Types of Screwing Taps Based on Flutes* — (*see* Fig. 1A).

3.2.3.1 *Straight flute screwing tap* — A screwing tap having straight flutes on the cutting portion.

3.2.3.2 *Helical flute screwing tap* — A screwing tap having right-hand or left-hand helical flutes on the cutting portion.

3.2.3.3 *Fluteless screwing taps* — A screwing tap without flutes.

3.2.3.4 *Screwing taps with spiral point* — A screwing tap having a spiral point at the cutting face of the land and the chamfered end.

3.2.4 *Classification on Direction of Cutting*

3.2.4.1 *Right-hand screwing tap* — A screwing tap which cuts while rotating in clock-wise direction when viewed from the shank end of the screwing tap.

3.2.4.2 *Left-hand screwing tap* — A screwing tap which cuts while rotating in anti-clockwise direction when viewed from the shank end of the screwing tap.

3.2.5 *Types of Screwing Taps Based on Shanks* — (*see* Fig. 1B).

3.2.5.1 *Full diameter shank screwing tap with taper connecting portion* — A screwing tap with full diameter shank and a tapered connecting portion between shank and threaded portion.

3.2.5.2 *Full diameter shank screwing tap with recess* — A screwing tap with shank diameter greater than or equal to nominal diameter of screwing tap with a recess between shank and threaded portion.

3.2.5.3 *Relieved shank screwing taps* — A screwing tap with shank diameter smaller than the minor diameter of the threaded portion.

3.3 General plan of screwing taps covered in Indian Standards are as given in Table 1.

3.4 **Elements** — Shall be as given in Fig. 2.

3.4.1 *Axis* — The longitudinal centre line of the screwing tap.

3.4.2 *Body* — The threaded portion extending from the entering end of the screwing tap to the shank. The length does not include the external centre that may be provided to facilitate manufacturing and inspection.

3.4.3 *Cutting Edge* — The edge formed by the intersection of the flute face and thread profile.

3.4.4 *Flank* — The inclined faces of the thread profile.

3.4.5 *Face* — That portion of the flute surface adjacent to the cutting edge upon which the chip impinges as it is cut from the work.

3.4.6 *Heel* — The edge formed by the intersection of the relieved surface behind the cutting edge and the flute.

3.4.7 *Land* — The portion of the thread profile between the face and the relieved portion of the thread.

3.4.8 *Thread Relief* — The clearance provided on screwing tap land by reducing the diameter of the entire thread form between the cutting edge and the heel.

3.4.8.1 *Full thread relief* — Radial relief in thread form starting at the cutting edge and continuing up to the heel.

3.4.8.2 *Partial thread relief* — Radial relief in the thread form provided behind the unrelieved land.

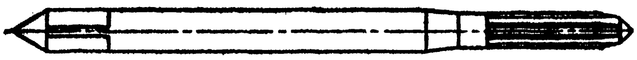
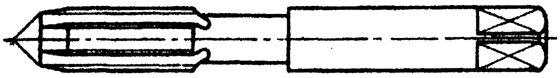
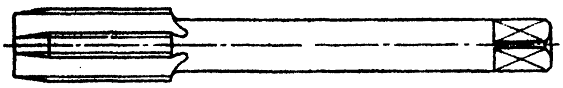
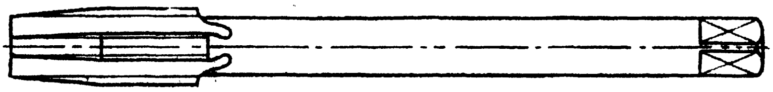
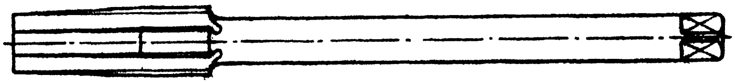
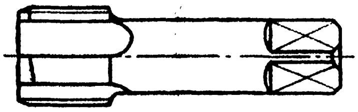
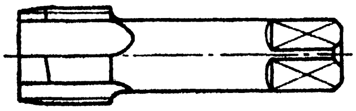
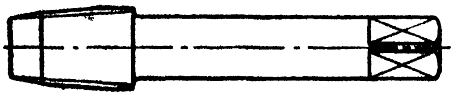
3.4.9 *Flutes* — The grooves in the body of screwing tap to provide cutting edges to permit the removal of chips and to allow lubricant or coolant to reach the cutting edges.

3.4.10 *Flute Run-over* — The flute run-over is situated at the shank end of the flute and is formed by flute milling cutter or grinding wheel at the termination of the cut.

3.4.11 *Spiral Point or Gun-nose* — The angular fluting in the cutting face of the land at the chamfered end. It is formed at an angle with respect to the axis of a screwing tap, and is in opposite direction to that of cutting.

Table 1 General Plan of Screwing Taps

(*Clause* 3.3)

Figure	**Covered in IS**
	IS 6175 (Part 1) : 1991 Screwing taps — Specifications Part 1 Hand and short machine screwing taps for ISO metric screw threads sizes from M1 to M2·5 (*second revision*)
	IS 6175 (Part 2) : 1991 Screwing taps — Specifications Part 2 Hand and short machine screwing taps for ISO metric screw threads sizes from M3 to M10 (*second revision*)
	IS 6175 (Part 3) : 1991 Screwing taps — Specifications Part 3 Hand and short machine screwing taps for ISO metric screw threads sizes M3 to M68 with coarse pitches and from M3 to M100 with fine pitches (*second revision*)
	IS 6175 (Part 4) : 1991 Screwing taps — Specifications Part 4 Long shank machine screwing taps for ISO metric screw threads sizes from M3 to M24
	IS 6175 (Part 5) : 1991 Screwing taps — Specifications Part 5 Nut screwing taps for ISO metric screw threads sizes from M3 to M68 with coarse pitches
	IS 6175 (Part 6) : 1991 Screwing taps — Specifications Part 6 Screwing taps for pipe threads parallel G series
	IS 6175 (Part 7) : 1991 Screwing taps — Specifications Part 7 Screwing taps for pipe threads parallel Rp series
	IS 6175 (Part 8) : 1991 Screwing taps — Specifications Part 8 Screwing taps for pipe threads taper Rc series

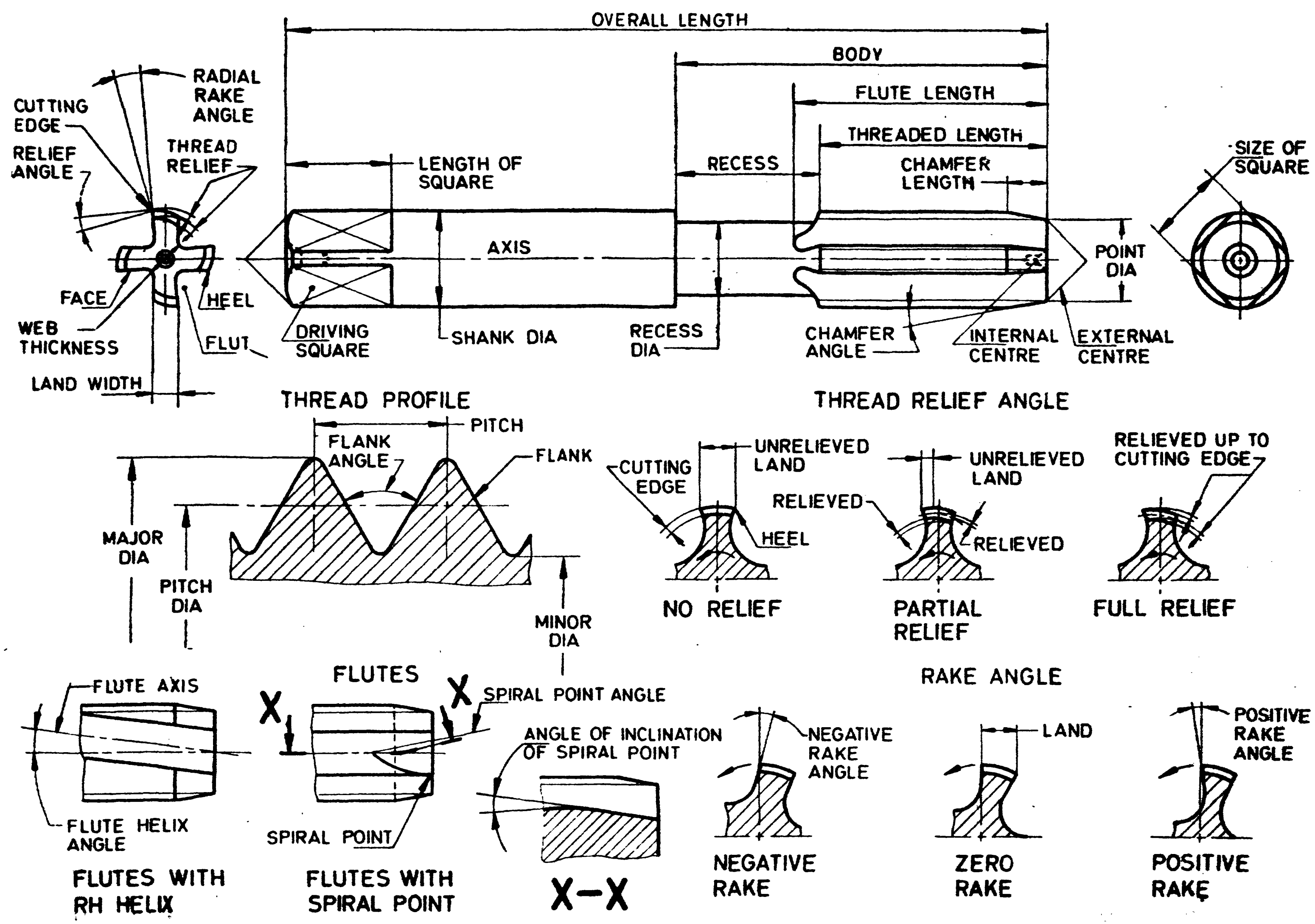


Fig. 2 Elements of screwing Taps

3.4.12 *Chamfer or Taper Lead* — The taper cutting portion provided with cutting clearance at the entering end of the screwing tap to distribute the cutting action over several thread forms and to facilitate the entry of the screwing tap into the hole.

3.4.13 *Chamfer Relief* — The gradual decrease in land height from the cutting edge to heel on the chamfered portion of the land to provide radial clearance for the cutting edge.

3.4.14 *Web* — The central portion of the screwing tap situated between the roots of the flutes and extending along with fluted portion of screwing tap.

3.4.15 *Web Taper* — The increase of the web thickness from the entering end of the screwing tap towards the shank.

3.4.16 *Recess* — A relieved portion between threaded length and shank length.

3.4.17 *Shank* — That portion of the screwing tap by which it is held or located.

3.4.18 *Driving Square* — That portion of the extreme end of the screwing tap shank with square section by which the screwing tap is held and driven.

3.5 **Linear Dimensions** — Shall be as given in Fig. 2.

3.5.1 *Nominal Size* — The designation which is used for the purpose of general identification.

3.5.2 *Pitch* — The distance from any point on screw thread to a coresponding point on the next thread measured parallel to the axis.

3.5.3 *Major Diameter* — It is the measurement over the crests of the threads of the screwing tap.

3.5.4 *Pitch Diameter* — It is the diameter of an imaginary co-axial cylinder which would pass through the threads at such points as to make the width of the threads and the width of the spaces between the threads equal at those points. It is also known as flank diameter or effective diameter.

3.5.5. *Minor Diameter* — It is the measurement over the roots of the threads of screwing tap.

3.5.6 *Point Diameter* — For all screwing taps with chamfer of taper lead, the measurement across the cutting edges at the small end of the taper lead.

3.5.7 *Thread Limits* — The two extreme permissible limits of size within which the actual screwing tap thread elements shall lie.

3.5.8 *Land Width* — The distance measured directly from the cutting edges till the unrelieved portion of the thread profile.

3.5.9 *Web Thickness* — The diamension of the web measured diametrically at the entering end of the screwing tap.

3.5.10 *Threaded Length* — The axial length of the threaded portion of the screwing tap including the chamfer lead.

3.5.11 *Chamfer Length or Taper Lead Length* — The length of chamfer measured axially.

3.5.12 *Flute Length* – The axial length of the fluted portion of the body including the flute run-over.

3.5.13 *Back Taper* — The reduction in diameter of the thread profile from the entering end towards the shank end.

3.5.14 *Size of Square* — The dimensions across the flats of the driving square at the end of shank.

3.5.15 *Length of Square* — The length of the driving square at the end of shank measured along the axis.

3.5.16 *Overall Length* — The axial length over the extreme ends of the screwing taps excluding external centres if provided at the either ends.

3.6 **Angles** — Shall be as given in Fig. 2.

3.6.1 *Flank Angle* — The angle included between the flanks of the thread, measured in axial plane.

3.6.2 *Radial Rake Angle* – The angle formed in a diametrical plane between the face and a radial line from the cutting edge at the crest of the thread form.

3.6.2.1 *Zero radial rake* —If the face and the radial line coincide, the angle is zero and the face is called radial.

3.6.2.2 *Positive radial rake* — If the angle formed by the face and the radial line falls behind the radial line in relation to the direction of cut, then the radial rake angle is positive and the face is known as under-cut.

3.6.2.3 *Negative radial rake* — If the angle formed by the face and the radial line falls in front of the radial line in relation to the direction of cut then the radial rake angle is negative and the face is known as over-cut.

3.6.3 *Relief Angle* — The equivalent angle between a relieved land surface and the tangent to the cutting diameter circle of the screwing tap at the crest of the thread form.

3.6.4 *Chamfer Angle* — The angle formed by the cutting edges of the taper lead and screwing tap axis.

3.6.5 *Spiral Point Angle* — The angle which the projection of the spiral point flute makes with the screwing tap axis.

3.6.6 *Angle of Inclination of Spiral Point* — The angle of inclination of the spiral point flute, with reference to the straight flute of the screwing tap.

3.6.7 *Flute Helix Angle* — The angle formed between the leading edge of the land and the screwing tap axis.

4 MATERIAL

The material of screwing tap shall be as given below:

One-piece construction : High speed steel
Two-piece construction
Cutting portion : High speel steel
Shank portion : Carbon steel with tensile strength not less than 700 MPa (before construction)

NOTE — Unless otherwise specified, the high speed steel shall be XT87W6MO5Cr4V2 or XT72W18Cr4V1 according to IS 7291 : 1981 or equivalent, in which case the major constituents shall be specified by the manufacturers.

5 HARDNESS

The hardness of the screwing taps shall be as given below:

Cutting portion : (measured on land) 760 *HV Min* 900 *HV Max*

Driving square :

One-piece construction 320 *HV Min*
Maximum hardness shall not exceed the hardness of the threaded length of the screwing tap

Two-piece construction 320 *HV Min* 450 *HV Max*

5.1 A recommended method of testing hardness on cutting portion is given in Annex B.

6 GENERAL REQUIREMENTS

6.1 Flutes

All screwing taps shall have straight flutes, unless otherwise specified. The number of flutes for a screwing tap shall be as given in the dimensional standard of the screwing tap. The face of the screwing tap shall be ground.

6.2 The recommended helical flute angles shall be as given in Table 2. The angle of helical flute is measured at the outside diameter. It is chosen from one of the series designated by R15 (slow helix), R35 (medium helix), R45 (fast helix) for a right-hand helix and from the series L15 for a left-hand helix. A variation of 2° is applied on the actual value chosen by the manufacturer from the R20 Renard series.

6.3 Rake Angle

The recommended rake angles for screwing taps shall be as given below:

Material	Rake Angle
Steel with tensile strength < 900 Mpa	10° ± 2°
Steel with tensile strength > 900 Mpa and Grey cast iron GG18 to GG26	5° ± 2°
Copper, light alloys yielding long chips	18° ± 2°

6.4 Spiral Point Angle

The spiral point angle shall be 8° ± 3° for screwing tap sizes below 12 mm and shall be 15° ± 3° for sizes 12 mm and above.

6.5 Thread Relief

All ground threaded screwing taps having nominal diameter 6 mm and above shall be provided with thread relief. The value of thread relief shall be as given below:

M6 to M10 — 0·02 mm/land width
M12 to M36 — 0·04 mm/land width

In case of helical flute taps unless otherwise specified, no thread relief is provided, up to nominal diameter 6 mm.

6.6 Dimensions of Chamfer — Shall be as given in Table 3.

6.7 Radial Run-out — Shall be as given in Table 4.

6.8 Direction of Cutting

Unless otherwise specified, right hand cutting shall be provided.

6.9 Back Taper

The screwing taps shall have back taper of 1.100 0 maximum and therefore the dimensions of the threads shall be measured on second or third thread behind the chamfer lead.

6.10 Serial screwing taps shall be supplied individually or in sets as required by the purchaser.

6.11 If required by the purchaser, serial screwing taps for ISO metric screw threads with coarse pitch shall be supplied in sets of three taps, namely Rougher, Intermediate and Finisher.

6.12 If required by the purchaser, serial screwing taps for ISO metric screw threads with fine pitch shall be supplied in sets of two taps, namely Rougher and Finisher.

6.13 Dimensions and tolerances on threaded portion of the screwing tap shall be according to IS 6173 (Parts 1 and 2) : 1991.

Table 2 Recommended Helical Flute Angles
(*Clause* 6.2)

Series	Name	Symbol	Range of Halix Angle Values in Degrees		Tolerance on the Chosen Value	Lead
			above	up to & including		
Right Hand Helix	Slow	R15	10	20	± 2·0 Degrees	Chosen from R20 Series
	Medium	R35	20	40		
	Fast	R45	40			
Left Hand Helix	Slow	L15	10	20		

6.14 Tolerances on overall length shall be h16 and on threaded length it shall be as given below:

Nominal Diameter of Tap in mm		Deviation on Thread Length in mm
Over	Including	
—	5·5	0 to—2·5
5·5	12·0	0 to—3·2
12·0	39·0	0 to—5·0
39·0	—	0 to—6·3

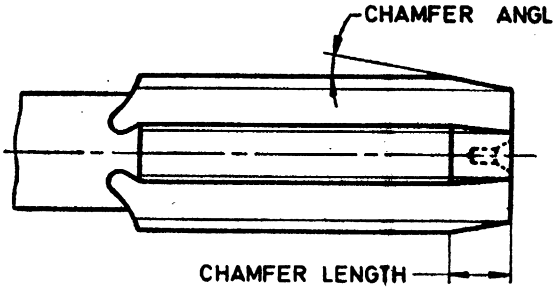
6.15 Class of Tap

Unless otherwise specified, the screwing tap shall be supplied with tolerance class 6H according to IS 6173 (Part 1) : 1991 for ISO Metric Screw Thread screwing taps.

6.16 The recommendations of the drill size prior to tapping shall be according to IS 10952: 1984.

6.17 The screwing taps with diameter 6 mm and below shall be provided with an external centre at the cutting end. The type of centres provided

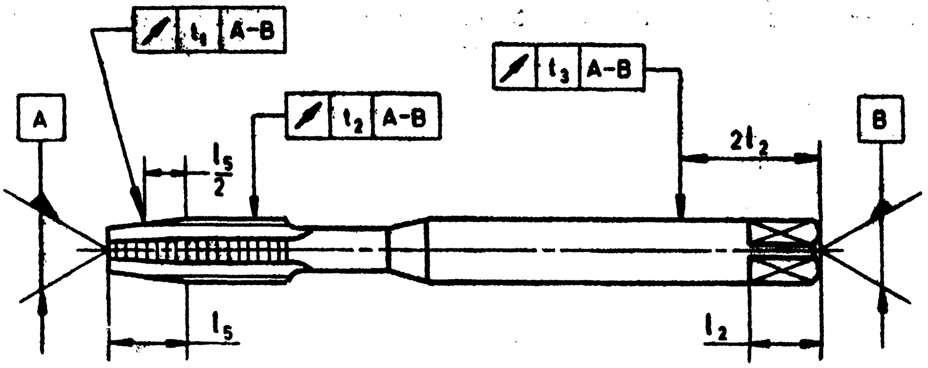
Table 3 Dimensions of Chamfer
(*Clause* 6.6)



Taps in Set	Types of Tap		Chamfer Angle in Degrees	Chamfer Length Approx
	Serial	Non-serial		
3 (For coarse pitch)	Rougher	Taper	5	8 Threads
	Intermediate	Second	10	4 Threads
	Finisher	Bottoming	20	[1]2 to 3 Threads
2 (For fine pitch)	Rougher	Taper	7	6 Threads
	Finisher	Bottoming	20	[1]2 to 3 Threads
1	Nut		2	20 Threads

[1] The approximate word indicated in the column heading is not applicable here as the range has been specified.

Table 4 Radial Run-out
(*Clause* 6.7)



Diameter in mm		Radial Run-out (TIR)[1] in µm					
		Ground Thread			Cut Thread		
Above	Up to and Including	t_1	t_2	t_3	t_1	t_2	t_3
—	10	30	30	30	60	60	60
10	18						
18	30	35	35	40	70	70	80
30	40	40			80		
40	—		40			80	

[1] Total indicator reading.

at the end of shank shall be at the discretion of the manufacturer. Taps having diameter above 6 mm shall have centre holes conforming to IS 2473 : 1975.

6.18 Since the accuracy of tapping depends on the material to be tapped, the tapping attachment, the cutting speed, the lubricant, the condition of the machine tool, etc, the users are recommended to select the class of screwing tap consistent with the class of tapped hole required. The dimension of threads produced shall conform to IS 4218 : 1976 (Parts 1 to 6) for the class of tapped hole selected.

6.19 In case of pipe threads parallel and taper where pressure-tight joints are required the dimensions of the threads produced shall conform to IS 554 : 1985.

6.20 In case of pipe threads for fastening purposes the dimensions of the threads produced shall conform to IS 2643 (Parts 1 to 3) : 1975.

6.21 The tolerance on length of square of the screwing tap shall be as given in Table 5.

7 PROTECTIVE COATING

Each screwing tap shall be covered with a suitable rust proofing material.

Table 5 Tolerance on Length of Square
(*Clause* 6.21)

Length of Square mm		Tolerance
Over	Up to and Including	
—	5	± 0·5 mm
5	20	± 1·0 mm
20	40	± 1·5 mm
40	—	± 2·0 mm

8 SAMPLING

The sampling and criteria of acceptance shall be in accordance with IS 7778 : 1975.

9 TESTS

9.1 Inspection

The screwing tap shall be inspected for workmanship and dimensions in accordance with the relevant product standards.

NOTE — The thread dimensions shall be measured on the second or third thread behind the chamfer lead.

9.2 Performance Test

A steel plate of Fe 360 IS 1570 (Part 1) : 1978 and having a thickness from nominal dia to twice the nominal diameter of the screwing tap shall be used as a blank. After drilling holes, the holes shall be tapped. Each screwing tap shall be used to tap four holes in a manner consistent with its normal use. A suitable cutting fluid may be used. The threads produced shall be clean and shall be with the tolerance grade 6H specified in IS 4218 (Parts 1 to 3) : 1976, wherever class of screwing tap is not mentioned in the case of ISO Metric Screw Threads, the threads shall be within the appropriate tolerance grade of threads, applicable to each class of screwing tap. After the test, the screwing tap shall not show any signs of damage, crack or noticeable loss of cutting efficiency.

10 MARKING

10.1 Screwing taps shall be marked as indicated in Fig. 3.

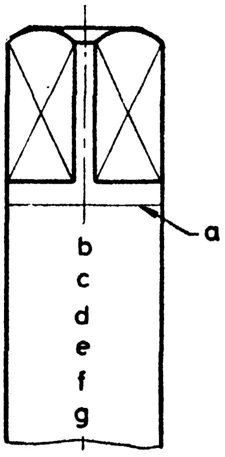


FIG. 3 MARKING

a) **Ring mark**
(For serial screwing taps only, no ring mark for finisher, one ring mark near the square end of shank for Rougher and two ring mark for Intermediate screwing taps)

b) Designating size M10

c) Class of screwing tap 4H
(Other than 6H)

d) Meterial of cutting portion ... ... H.S.S.

e) Letter 'C' ... ... 'C'
(Only for cut thread screwing taps)

f) Letter 'L' ... ... 'L'
(for left-hand thread screwing taps)

g) Indicating the source of manufacture ... ... —

NOTES

1 The figure is indicative of marking arrangement and not the position.

2 In case of non-serial screwing taps there is no distinct markings as they can be visually be identified from the chamfer lengths.

11 PACKING

Each screwing tap or a set of screwing tap shall be wrapped in non-absorbent paper and packed in a carton. The carton shall bear the following information:

- a) Type of screwing tap;
- b) Designating size;
- c) Material, and
- d) Manufacturer's name, initial or trade-mark.

NOTE — Only one type and size of screwing tap shall be packed in one carton.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
554 : 1985	Dimensions for pipe threads where pressure tight joints are made on threads (*third revision*)
1501 (Part 1) : 1984	Method for Vickers hardness test for metallic materials: Part 1 HV 5 to HV 100 (*second revision*)
1570 (Part 1) : 1978	Schedules for wrought steels : Part 1 Steel specified by tensile and/or yield properties (*first revision*)
2473 : 1975	Dimensions for centre holes (*first revision*)

IS No.	*Title*
2643	Dimensions for pipe threads for fastening purpose :
(Part 1) : 1975	Part 1 Basic profile and dimensions
(Part 2) : 1975	Part 2 Tolerances (*first revision*)
(Part 3) : 1975	Part 3 Limits of sizes (*first revision*)
4218	ISO Metric screw threads :
(Part 1) : 1976	Part 1 Basic and design profiles (*first revision*)
(Part 2) : 1976	Part 2 Diameter pitch combinations (*first revision*)
(Part 3) : 1976	Part 3 Basic dimensions for design profiles (*first revision*)
(Part 4) : 1976	Part 4 Tolerancing system (*first revision*)
(Part 5) : 1979	Part 5 Tolerances (*first revison*)
(Part 6) : 1978	Part 6 Limits of sizes for commercial bolts and nuts (diameter range 1 to 52 mm) (*first revision*)
6173 (Parts 1 and 2): 1991	Screwing taps — Dimensions and tolerances on threaded portion
6175	Screwing taps:
(Part 1) : 1991	Part 1 Hand short machine screwing taps for ISO metric screw threads sizes M1 to M2·5 — Specification (*second revision*)
(Part 2) : 1991	Part 2 Hand and short machines screwing taps for ISO metric screw threads sizes M3 to M10 — Specification (*second revision*)
(Part 3) : 1991	Part 3 Hand and short machine screwing taps for ISO metric screw threads sizes M3 to M68 with coarse pitches and M3 to M100 with fine pitches — Specification (*second revision*)
(Part 4) : 1991	Part 4 Long shank machine screwing taps for ISO metric screw threads sizes M3 to M24 — Specification (superseding IS 7821)
(Part 5) : 1991	Part 5 Nut screwing taps for ISO metric screw threads sizes M3 to M68 with coarse pitches — Specification (superseding IS 6174)
(Part 6) : 1991	Part 6 Screwing taps for pipe threads parallel G series — Specifications (superseding IS 6172)
(Part 7) : 1991	Part 7 Screwing taps for pipe threads sparallel R_p series — Specifications (superseding IS 6172)
(Part 8) : 1991	Part 8 Screwing taps for pipe threads taper R_c series — Specifications (superseding IS 7796)
7291 : 1981	High speed tool steels
7778 : 1975	Method of sampling small tools
10952 : 1984	Recommendations for drills for use prior to tapping screw threads

ANNEX B

(*Clause* 5.1)

RECOMMENDED METHOD OF CHECKING HARDNESS

The hardness test shall be made as per IS 1501 (Part 1) : 1984

Tap Dia in mm		**Element on Which the Hardness is to be Examined**	**Force to be Applied on Vickers Hardness Tester in Newtons**
Over	Up to and Including		
—	6 with external centre	Grind a small flat (1 mm *Min*) on the external centre in cutting edge side and hold vertically to check the hardness on this flat portion	98·07 to 294·2N (HV 10 to HV 30)
6 with centre hole	—	Hold vertically and check on the flat face near the taper lead	

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BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :

Central :	Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	331 01 31 331 13 75
Eastern :	1/14 C.I.T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	37 86 62
Northern :	SCO 445-446, Sector 35-C, CHANDIGARH 160036	53 38 43
Southern :	C. I. T. Campus, IV Cross Road, MADRAS 600113	41 29 16
Western :	Manakalaya, E9 MIDC, Marol, Andheri (East) BOMBAY 400093	632 92 95

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